REMARKS

Claims 1-49 are pending. Claims 1-49 stand rejected in the Office Action mailed April 23, 2003.

Claims 1-28 are rejected under 35 U.S.C. §103(a) as being unpatentable over US Patent Number 6,438,266 of Bajaj et. al (hereafter Bajaj) in view US Patent Number 6,476,805 of Shum et. al (hereafter Shum).

Claims 29-49 are rejected under 35 U.S.C. §103(a) as being unpatentable over Bajay and the alleged knowledge in the art.

Rejections Under 35 U.S.C. §103

The Examiner rejected claims 1-28 under 35 U.S.C. §103(a) as being unpatentable over Bajaj and Shum. Claims 1-28 are patentable under 35 U.S.C. §103 in view of the references cited by the Examiner. Neither of the cited references teach (nor does the Office Action cite any portion which even suggests) the presently claimed feature of performing scalar quantization on the three-dimensional graphics model geometric data.

In regard to the rejection of claim 1, the Examiner has stated in part that:

> Bajaj discloses a method comprising...performing scalar quantization on the graphic data (col. 17, line 13)....
> Bajaj does not disclose encoding the graphic data differentially.
> Shum discloses using differential encoding. (col. 25, lines 59-65).

(4/23/03, Office Action, p. 2)

There is no motivation to combine Bajaj and Shum. Infact, they teach away from each other. Bajaj discloses a method of encoding images of 3-D objects with improved rendering time and transmission processes. (Bajaj, title) In contrast, Shum describes techniques for spatial displacement estimation and multi-resolution operations on light fields. (Shum, title). Thus, Shum in his own specification admits that he is not dealing with three dimensional graphics models, but light fields. Shum states that "while the images of a light field are spatially related, temporal relationships between light field images are not fixed." (Shum, col. 10, ll. 6-8).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988).

However, nowhere is there any indication that the references provide any motivation for the recited combination. Instead, it appears the teachings of the present application have been used as a blueprint to gather together and assemble various components of the prior art in the manner contemplated by applicants. This is a classic example of the use of hindsight reconstruction, and cannot properly be used as grounds for rejecting the present claims.

The U.S. Court of Appeals for the Federal Circuit has strongly criticized such applications of hindsight by specifically indicating that when an obviousness determination is made based upon a combination of references, even a patent examiner "must show reasons that the skilled artisan, confronted with the same problems as the inventor *and with no knowledge of the claimed invention*, would select the elements from the cited prior art references for combination in the manner claimed." *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998) (Emphasis added). Merely indicating, as the Examiner argues in his Office Action of April 23, 2003, that the claimed invention would be obvious to one of ordinary skill in the art based on the combination of the references is utterly inadequate. *Rouffet,* at 1357. Instead, what is needed is a showing of motivation, either from the references themselves or the knowledge of those of ordinary skill in the art, for the combination being relied upon. *Rouffet,* at 1357.

In the present case, there has been no showing of such motivation. Instead, the Examiner attempts to deconstruct the subject matter of the claims of the present application into its constituent components, states where each such component may be found in one of the cited references, and then concludes that it would have been obvious to combine the references to arrive at the claimed invention. This bare bones analysis is not sufficient to support a determination of obviousness of the present application. The burden is on the Examiner to show *why* one is so

motivated as to come up with the combination being relied upon. *Rouffet,* at 1357-1358 ("If such a rote invocation could suffice to supply a motivation to combine, the more sophisticated scientific fields would rarely, if ever, experience a patentable technical advance. Instead, in complex scientific fields [an infringer or the Patent Office] could routinely identify the prior art elements in an application, invoke the lofty level of skill, and rest its case for [obviousness]. To counter this potential weakness in the obviousness construct, the suggestion to combine requirement stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness.")

In regard to the rejection of claim 1, even if Bajaj and Shum were combined, such a combination would lack one or more features of claim 1. Claim 1 recites the feature of performing scalar quantization on the three-dimensional graphics model geometric data. (Emphasis added) Neither Bajaj, nor Shum disclose this feature as seen by the following analysis. Bajaj discloses a method of encoding images of 3-D objects with improved rendering time and transmission processes. (Bajaj, title) However, Bajaj does not utilize scalar quantization. Bajaj uses geometry encoding using vector quantization. (Bajaj, col. 10, l. 16-col. 13, l. 60) For example, Bajaj provides an improved productive vector quantization scheme to efficiently encode vertex coordinates...advantageously realized in particulars of codebook design, nearest neighbor searching, and error/distortion control. (Bajaj, col. 10, ll. 27-32). In fact, Baja presents a productive *vector quantizer*...where a vector is expressed in spherical coordinates. (Bajaj, col. 17, ll. 3-5) Nowhere in Bajaj is a description of performing scalar quantization.

Nor does Shum describe performing scalar quantization on the three-dimensional graphics model geometric data. (Claim 1, emphasis added). Shum describes techniques for spatial displacement estimation and multi-resolution operations on light fields. (Shum, title). Thus, Shum is not dealing with three dimensional graphics models, (as claimed in claim 1) but light fields. Shum states that "while the images of a light field are spatially related, temporal relationships between light field images are not fixed." (Shum, col. 10, ll. 6-8). Shum discusses that after

forming wavelet blocks of a light field image, a compression unit codes the wavelet blocks by embedded zero-tree coding using successive approximation quantization and arithmetic coding. (Shum, col. 18, ll. 27-35) Shum distinguishes his successive approximation coding method from adaptive quantization, vector quantizaltion and scalar quantization. (Shum, col. 18, ll. 36-65). Thus, Shum does not describe performing scalar quantization on the three-dimensional graphics model...as claimed by applicants' claim 1. Because neither Bajaj nor Shum disclose this feature as taught by applicants and given that claims 2-7 depend directly or indirectly from claim 1, applicants respectfully submit that claims 1-7 are not obvious under 35 U.S.C. §103(a) by Bajaj in view of Shum.

The Examiner also rejected independent claim 8 under 35 U.S.C. §103(a) for the reason set forth in the rejection of claim 1. Claim 8 discloses substantially similar limitations as claim 1, and recites "means for performing scalar quantization on the three-dimensional graphics model..." (Emphasis added) Because, neither Bajaj nor Shum disclose this feature as taught by applicants for the reasons discussed above with regard to claim 1, applicants respectfully submit that claim 8 is not obvious under 35 U.S.C. §103(a) by Bajaj in view of Shum. Furthermore, because neither Bajaj nor disclose this feature as taught by applicants in independent claim 8 from which claims 9-14 depend, applicants respectfully submit that claims 8-14 are not obvious under 35 U.S.C. §103(a) by Bajaj in view of Shum.

The Examiner also rejected independent claim 15 under 35 U.S.C. §103(a) for the reason set forth in the rejection of claim 1. Claim 15 discloses substantially similar limitations as claim 1, and recites "performing scalar quantization on the three-dimensional graphics model." (Emphasis added) Because, neither Bajaj nor Shum disclose this feature as taught by applicants for the reasons discussed above with regard to claim 1, applicants respectfully submit that claim 15 is not obvious under 35 U.S.C. §103(a) by Bajaj in view of Shum. Furthermore, because neither Bajaj nor Shum disclose this feature as taught by applicants in independent claim 15 from which claims 16-21

depend, applicants respectfully submit that claims 15-21 are patentable under 35 U.S.C. §103(a) over Bajaj and Shum.

The Examiner also rejected independent claim 22 under 35 U.S.C. §103(a) for the reason set forth in the rejection of claim 1. Claim 22 discloses substantially similar limitations as claim 1, and recites "the processor performs scalar quantization and parameterization on three-dimensional graphics model." (Emphasis added) Because, neither Bajaj nor Shum disclose this feature as taught by applicants for the reasons discussed above with regard to claim 1, applicants respectfully submit that claim 22 is not obvious under 35 U.S.C. §103(a) by Bajaj in view of Shum. Furthermore, because neither Bajaj nor Shum disclose this feature as taught by applicants in independent claim 22 from which claims 23-28 depend, applicants respectfully submit that claims 22-28 are patentable under 35 U.S.C. §103(a) over Bajaj and Shum.

The Examiner rejected claims 29-49 under 35 U.S.C. §103(a) as being unpatentable over Bajaj and the alleged knowledge in the art. Claims 29-49 are patentable under 35 U.S.C. §103 in view of the reference cited by the Examiner. Bajaj does not teach (nor does the Office Action cite any portion which even suggests) the presently claimed feature of performing scalar quantization on the three-dimensional graphics model geometric data.

In regard to the rejection of claim 29, the Examiner has stated in part that:

> Bajaj discloses generating actual quantized spherical coordinate values....Bajaj does not explicitly disclose deparameterization or dequantization. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to decode by deparameterization and dequantization of the encoded data.

(4/23/03, Office Action, p. 5)

In regard to the rejection of claim 29, even if Bajaj and Shum were combined, such a combination would lack one or more features of claim 29. Claim 29 recites the feature of performing scalar dequantization on actual quantized spherical coordinate values. (Emphasis

added) Neither Bajaj, nor Shum disclose this feature as seen by the following analysis. Bajaj discloses a method of encoding images of 3-D objects with improved rendering time and transmission processes. (Bajaj, title) However, Bajaj does not utilize scalar quantization or dequantization. Bajaj uses geometry encoding using vector quantization. (Bajaj, col. 10, l. 16-col. 13, l. 60) For example, Bajaj provides an improved productive vector quantization scheme to efficiently encode vertex coordinates...advantageously realized in particulars of codebook design, nearest neighbor searching, and error/distortion control. (Bajaj, col. 10, ll. 27-32). In fact, Baja presents a productive *vector quantizer*...where a vector is expressed in spherical coordinates. (Bajaj, col. 17, ll. 3-5) Nowhere in Bajaj is a description of performing scalar quantization or scalar dequantization. Because neither Bajaj nor the alleged knowledge disclose this feature as taught by applicants and given that claims 30-33 depend directly or indirectly from claim 29, applicants respectfully submit that claims 29-33 are not obvious under 35 U.S.C. §103(a) by Bajaj in view of the alleged knowledge.

The Examiner also rejected independent claim 34 under 35 U.S.C. §103(a) for the reason set forth in the rejection of claim 29. Claim 34 discloses substantially similar limitations as claim 29, and recites "means for performing deparameterization and scalar dequantization on the actual quantized spherical coordinate..." (Emphasis added) Because, neither Bajaj nor the alleged knowledge disclose this feature as taught by applicants for the reasons discussed above with regard to claim 29, applicants respectfully submit that claim 34 is not obvious under 35 U.S.C. §103(a) by Bajaj in view of the alleged knowledge in the art. Furthermore, because neither Bajaj nor disclose this feature as taught by applicants in independent claim 34 from which claims 35-38 depend, applicants respectfully submit that claims 34-38 are not obvious under 35 U.S.C. §103(a) by Bajaj in view of the alleged knowledge in the art.

The Examiner also rejected independent claim 39 under 35 U.S.C. §103(a) for the reason set forth in the rejection of claim 29. Claim 39 discloses substantially similar limitations as claim 29, and recites "performing deparameterization and scalar dequantization on the actual quantized

spherical coodinate values" (Emphasis added) Because, neither Bajaj nor the alleged knowledge disclose this feature as taught by applicants for the reasons discussed above with regard to claim 29, applicants respectfully submit that claim 39 is not obvious under 35 U.S.C. §103(a) by Bajaj in view of the alleged knowledge in the art. Furthermore, because neither Bajaj nor the alleged knowledge in the art disclose this feature as taught by applicants in independent claim 39 from which claims 40-43 depend, applicants respectfully submit that claims 39-43 are patentable under 35 U.S.C. §103(a) over Bajaj and the alleged knowledge in the art.

The Examiner also rejected independent claim 44 under 35 U.S.C. §103(a) for the reason set forth in the rejection of claim 29. Claim 44 discloses substantially similar limitations as claim 29, and recites "the processor performs scalar dequantization on compressed three-dimensional graphics model." (Emphasis added) Because, neither Bajaj nor the alleged knowledge in the art disclose this feature as taught by applicants for the reasons discussed above with regard to claim 29, applicants respectfully submit that claim 44 is not obvious under 35 U.S.C. §103(a) by Bajaj in view of the alleged knowledge in the art. Furthermore, because neither Bajaj nor the alleged knowledge in the art disclose this feature as taught by applicants in independent claim 44 from which claims 45-49 depend, applicants respectfully submit that claims 44-49 are patentable under 35 U.S.C. §103(a) over Bajaj and the alleged knowledge in the art.

Applicants respectfully submit that all rejections have been overcome. Consideration of this amendment should lead to favorable action that would overcome all remaining grounds of objection and/or rejection.

If there are any additional charges, please charge Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

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Sanjeet Dutta

Sanjeet K. Dutta
Reg. No. 46,145

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025-1026
(408) 947-8200